
THE EFFECT OF URBAN FORM ON TRAVEL BEHAVIOUR – Initial findings from In-depth Interviews and Focus Groups

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Abstract

Despite the continuing efforts of integrating transportation and land-use planning to promote sustainable growth, research findings remain divided in terms of the degree of influence of urban form on travel behaviour. While the success of land-use planning intervention lies in the direct influence the urban form on travel patterns, contextual legacy show variations in terms of the strength of this influence. Due to complex inter-relationships between urban form, socio-economic conditions, demographic influences, personal preferences and travel behaviour involving a multitude of variables, their mechanism result in unique inter-dependency patterns in every individual context which needs to be addressed specifically. Whilst major emphasis of research in this field has been on the quantitative association, this study uses a two prong approach using extensive qualitative exploration to generate a theory explaining the reasons for these particular travel patterns in the study context which is grounded in the data collected from the individuals compounded by the rigor of quantitative analysis to ascertain the actual strength and nature of the inter-relationships and their relative influence on travel behaviour. This paper presents some initial results from the first stage of the study which extensively explores the various issues related to travel patterns using in-depth interviews and focus group discussions from three case study areas in Northern Ireland. This data collected from a diverse populous gives a deeper insight into people's views and perceptions on general travel patterns as no similar data exists in the particular context. The findings highlight issues that are relevant to the Northern Ireland context showing the impact of people's preferences and lifestyle choices relating to urban form that impact on their travel behaviour. These results aid further understanding for robust inferences on the effect of urban form on travel behaviour and to identify the areas where policy intervention may prove more effective for addressing sustainability targets.

Key Words: Urban form, Travel behaviour, Qualitative exploration, Contextual legacy, Preferences, Sustainability.

1. Introduction

The relationship between urban form and travel behaviour has gained particular interest to scholars and policy makers to achieve a broader global goal of sustainable growth amidst current concerns for climate change to achieve a balance between economic and social development and environmental issues. The sustainability paradigm was initiated by the Brundland report, to direct growth such that the current growth patterns do not have an adverse effect on the future generation [24], followed by the Rio Earth summit in 1992 in which authorities were encouraged to adopt the recommendations of the Brundtland report to tackle environment degradation issues. The Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) in 1997 finally set the binding obligation to reduce greenhouse emissions and with the transport and land use sector accounting for 24.3% of the total greenhouse gas emissions [9], any significant saving in this sector could account for overall reduction in greenhouse gas emissions. Thus there was a basic need to reduce travel and integrated approaches were sought in terms of policy to

integrate transport with the environment, land-use planning, different modes of transport and policies to achieve a sustainable growth.

Previous research has established linkages between urban form and travel behaviour; however their contextual settings have shown remarkably contrasting results [1], [3],[22],[13]. In Northern Ireland in particular, little research has been conducted in this area leaving a knowledge gap necessary for aiding planning policy decisions which are still dependent on conclusions drawn from other geographical settings.

The literature review clearly points out that there is evidence of a relationship existing between the urban form and travel behaviour; however, there is no general consensus. While quantitative studies dominate this sphere of research, several statistical and analytical methods have been used to establish this relationship. In the early 1980's studies attempted at establishing an association using more aggregate level analysis while the more recent studies are attempting to analyse the relationship at a more disaggregate level. Studies have broadly categorized the factors influencing travel behaviour as hard and soft variables, the former being the ones that can be objectively measured and perceived by an outsider whilst the latter are the more individual attitudes and preferences which cannot be measured by an outsider [21]. Thus studies have explored this relationship at both aggregate and disaggregate level and also studied the interactions using activity-based approach, choice models and simulation studies. Generally most studies using density as the urban form indicator used aggregate level data to establish the association with travel behaviour and energy consumption [22],[13]. More recent trends have emphasized the exploration of this relationship at disaggregate level data to further detangle the factors that influence travel behaviour as only disaggregation of data could analyse the micro-scale findings [5],[2],[20],[12]. Thus recent trends focus more on using disaggregate level data to spatially match the macro scale descriptors of the physical context with individual data on more subtle issues of choice and perception. Further, researchers advocate the need for finding the 'how' and 'why' for the built form and travel behaviour relationship requiring individual level investigation as the unit for measuring travel behaviour is the individual himself [10]. This calls for a more mixed method approach which also looks at the qualitative aspect of travel behaviour analysis to understand the rationale for these travel patterns. Thus disaggregate level of data is a pre-requisite for studying the individual's behavioural responses to the urban form and travel behaviour.

This paper presents the findings from the qualitative exploration of the factors influencing travel behaviour using focus group discussions and in-depth interviews from the selected case study areas in Northern Ireland. The next section gives a brief overview of the spatial strategy and transport policy in Northern Ireland and the interest in an integrated transportation and land use planning approach. This is followed by the design of the study, methodology and analysis of results. The final section discusses these results and presents conclusions on the predominant factors and the mechanism influencing travel patterns in Northern Ireland.

2. The Regional Spatial Policy and Transport Policy in Northern Ireland

Planning in Northern Ireland is currently centralised and fragmented in terms of deliverance involving different government departments [6]. While the Regional Development strategy and the Regional Transportation strategy is the responsibility of the Department for Regional Development (DRD), the subsequent Local Development Plans are drafted by the Planning service which is an agency of the Department of the Environment (DOE). Thus legislative planning powers rest with DOE and development permissions are granted by the Planning Service (DOE). In 2005, the planning policy statement 13(PPS13) was introduced by the Department for Regional Development (DRD) which strengthened the integration between the spatial planning and transport policy [11]. It was drawn from the strategic policy guidance set out by the Regional Development Strategy comprising of 12 general principles to integrate transportation and land-use planning; however, it had no legislative powers in terms of implementation of the guiding principles. Thus the PPS13 sets out the larger policy context for the integration of transportation and land use planning with emphasis on reducing car dependency, modal shift, constrain measures to influence travel behaviour and social

inclusion [8]. In practice, the direct link with planning is outlined in the General Principle 3, in the form of Transport assessment which is prepared by DRD and DOE, for any new development application. The main purpose of the transport assessment document was to assess the transport implications of any proposed development and the proposed measures to achieve sustainable travel patterns [15].

However following the Planning Bill introduced in Jan 2013, this centralized planning structure in Northern Ireland is to be replaced by a two-tier system. The objective of this Planning Bill is to modernise the planning system by transferring the majority of planning powers to local councils in 2015 [14]. This restructuring is aimed at strengthening the planning system to promote economic and sustainable growth while providing faster planning decisions and fairer appeals in a simpler way along with enhanced community involvement [14].

Thus sustainability has been pivotal in the policy framework in Northern Ireland and integrated measures in terms of transportation and land use planning is warranted to achieve this overarching aim.

3. The study

The study was designed to explore the factors influencing travel behaviour and examine the extent of influence of urban form in the Northern Ireland context. The study was particularly designed to (1) Explore the decision making process from the individual perspective on their travel patterns, (2) Understand the rationale for these choices and whether the choices are guided by utilitarian motives or are they simply a manifestation of strong individual preferences, (3) Understand the barriers and opportunities to influence people to adopt more sustainable alternatives and (4) Explore the implementation and acceptance of policy measures in terms of an integrated approach.

4. Methodology

Qualitative studies are still rare in research examining the relationship between urban form and travel behaviour which is still dominated by quantitative methods. Thus this study was designed to explore 'why' people travel by investigating and understanding the decision making process regarding travel behaviour from the individual perspective and identify the actual role of the individual factors in shaping these travel patterns.

4.1 Selection of Case study areas using an experimental design

Researchers have pointed out that traditional data collection in the field of travel behaviour at the individual level (disaggregate level) may strongly reflect more personal and household co-relations leading to bias in explanatory variables [18]. To overcome this bias the case study areas need to be selected in such a fashion that there is weak co-relation between the explanatory variable by selecting neighbourhoods with varying urban form and transportation network combinations. Thus macro-scale area descriptors at the electoral ward level (Density, Car ownership, Public transport network) were used as indicators to select the case study areas using aggregate level secondary data. Multiple deprivation unit measures were used to look for neighbourhoods in the middle band so that socio-economic conditions don't dominate the results. Thus the three case study areas selected for this study are Ballynafeigh ward, Belfast, Knockmore ward, Lisburn and Banbridge West ward, Banbridge.

Also in Northern Ireland, the urban spectrum is defined in relation to the existing infrastructure in four bands [7], where three bands are urban and the fourth represents rural. The three case study areas chosen also represent these three bands of the urban spectrum – level four represented by Ballynafeigh ward in Belfast, Level three represented by Knockmore ward in Lisburn and Level two represented by Banbridge West ward in Banbridge. Thus the whole range of the urban spectrum has been taken into account to look for the association between the urban form and travel behaviour.

4.2 Data Collection

The study used focus group discussions and in-depth interviews to explore the travel behaviour of the people in Northern Ireland. The interviews and focus groups were conducted between January and May 2013.

4.2.1 Participants and Interviewees

A total of 6 focus group discussions were conducted, two from each case study area, for the focus group discussions and the participants were mainly residents of the case study areas. The groups were recruited using a list of community organizations, PTA organizations, local clubs and other social groups in each case study area. The diversity of the participants in terms of age, ethnicity, occupation, car ownership, gender, socio-economic status and community involvement added to the richness of data.

A total of 17 interviews were conducted and the interviewees were mainly members of staff in the local councils, Government organizations and active community members. While some of the experts were identified directly through their organizations, the rest were recruited using the snowball technique. 17 interviews were conducted of which 16 were males and 1 female interviewee. The age group of the interviewees ranged between 34 to 67. Although the interviewees represented the more educated professionals, the focus group participants were recruited from a more diverse populous in terms of socio-demographic composition.

4.2.2 Procedure and Schedule

The Focus group discussions were conducted in the group's usual meeting place except in one situation in Knockmore where a venue was needed to be pre-arranged. They lasted typically between 35-50 minutes and were audio recorded with the participant's consent. However all the interviews were conducted in the individual's workplace and lasted between 35 minutes to 1 hour and 15 minutes, which were audio recorded as well with the interviewee's consent.

Both the focus group discussions and in-depth interviews were semi-structured and the extent to which each issue was discussed reflected the importance of the issue to the participant. Thus a variety of motives and opinions were explored in terms of their general perception of travel behaviour covering a range of topics relating to perceptions and preferences of urban form and travel behaviour which further highlights the relevant influencing factors in the Northern Ireland Context.

For the focus groups, contact was established, usually by phone call, with the leader of each group who was the contact point for consent and arrangement of the focus group discussion. The interviewee's were primarily contacted by email and the rest were recruited using a snowball technique. At the end of each interview, the expert was asked to recommend other professionals who could aid the understanding of these complex interrelationships.

4.3 Data processing

All the interviews and focus groups were transcribed verbatim. These transcripts were read and reread to assign provisional conceptual labels to each statement. These initial codes were then reanalysed to identify the emerging conceptual themes. These themes or initial concepts were then reanalysed and refined to identify the overarching categories explaining the relationship between urban form and travel behaviour in the study context.

5. Data Analyses

This section discusses the major themes and categories discovered from the transcribed data of the focus group discussions and in-depth interviews explaining the issues related to travel behaviour in the Northern Ireland context. As inherent to the qualitative nature of the investigation, the opening question for both the focus group discussions and in-depth interviews were open ended without any direction or structure to seek comments on the general travel patterns in their local area. This captured a variety of issues identified by the participants and the interviewees. Consequently these issues were further probed into with slightly more semi-structured questions to seek their experiences and opinions to identify the factors shaping the travel patterns. Although a convergence was sought in the process of

data collection to identify the main factors influencing travel patterns, no direct questions were used and each participant and interviewee was allowed to present their views and experiences from their own perspective. This enhanced the richness of the data as participants and interviewees varied in terms of age, gender, ethnicity, economic ability, religion, education, occupation and political pursuit. Seven overarching categories were identified from the data which are presented in the following sub-sections.

5.1 The geographical (spatial) context and travel mode choice

The geography of Northern Ireland plays a unique role in shaping the transport network and hence travel patterns, particularly in terms of the modality. It is bounded by the hills on two sides with the Belfast Lough on the third side. Thus a southern expansion of the city towards Lisburn was a natural geographical phenomenon with a radial structure of public transport network within the city. However these radial routes mean that there is excellent public transport connections to go to the city centre from any point on the radial routes however to go to any other part of the city one has to go to the centre and go out along that route. This means unnecessary longer journeys and extended travel times which diminishes the effectiveness of public transport.

"...it is a bit awkward to get to some parts of the city to other parts of the city because the way the bus service runs..... it's like the spokes of a wheel. If you want to move down the spoke to the city - it is easy, but if you want to get to a place on another spoke....."

(Male, 49 years, Ballynafeigh ward, Belfast)

This situation gets more acute as we move further down the urban spectrum and outside the main city limits where people's perception of travel mode completely changes along with their perception of urban form.

"Private car is the main transport option..... Northern Ireland is very rural in nature, two miles and you are in the countryside.....so if you are out of Belfast or maximum Lisburn, you are not left with any other option."

(Male, 46 years, Craigavon)

And this rural nature of Northern Ireland is supported by a generous road infrastructure which almost directly promotes the use of car. So whilst this spread-out rural nature of Northern Ireland exacerbates the car dependency, there seems really no other option as public transport cannot cater to all the different destinations that one may wish to go from a small town. Thus as you move away from Belfast, the rest of Northern Ireland is mostly perceived as rural. This is compounded by the aspiration and preference of the locals for rural countryside living which is somewhat shaped by traditional values which perceives car as the only mode of transport.

"The way you are brought up.... it obviously has an effect on the way you live..... there was no other option than to use the car and I think that has manifested itself in the later years, it breeds car dependency into ourselves as well..."

(Female, 35 years, Downpatrick)

"It is a cultural thing....here everybody uses a car if they can afford to have a car."

(Male, 53 years, Banbridge)

Thus the tendency of out-migration from the main city created the commuter towns which are situated outside the cities but are not so rural and isolated in nature. It may be perceived as a compromise to achieve mass location without hurting the anti-urban sentiment. This is gaining popularity and smaller towns have almost doubled in population due to inward-migration.

"Banbridge is a thriving town in one sense but basically it is a dormitory town for Belfast."

(Male, 67 years, Banbridge)

The reason for choosing to live in these commuter towns is the urban infrastructure, linkages and amenities it has to offer besides fulfilling the desire for sub-urban or rural living. However encouraging patterns are also observed like car-sharing, which is gaining popularity in these towns. And this pattern was observed amongst residents who were more educated working in offices. One reason for car sharing is their common destination and similar job profile but again there is a possibility that issues relating to environmental awareness have been instilled into them through travel plans and other soft policy measures at their workplace.

But on a broader perspective relating to the spatial context of Northern Ireland, the geographical size is the main reason for the sprawl and car travel as most destinations would still be within commute range.

"...because Northern Ireland is a small country, an hour or so will take you everywhere...."

(Male, 46 years, Craigavon)

Thus there is a strong connection between the spatial context of Northern Ireland and travel patterns although there are quite a few mediating factors like perception, preferences, past experience and other catalysts. We shall discuss these in more detail in the following sections.

5.2 Impact of Historical legacy on attitudes and perceptions shaping travel behaviour

The legacy of 'the troubles' arising from ethno-national conflicts in Northern Ireland has left a deep impact on the city's physical and social structure leading to social and residential mobility inequalities. An out-migration was the immediate consequence which led to the loss of inner-city population needed for the critical mass to support public transport infrastructure.

"...its creating the critical mass to be able to run an efficient and all day long PT service. So while you had the other cities in the 60's and 70's losing their population for different economic reasons, we were losing ours for economic and social reasons...."

(Male, 41 years, Belfast)

Thus disrupted travel patterns and unreliable public transport consequently resulted in the reliance on private car. This has also resulted in social mobility inequalities as people would remain contained in certain areas to which they associate their safety and kinship and these observations were not only in Belfast but also in other parts of the country. When asked for the reason for living in a particular area, the response of a participant immediately echoed these ethno-national conflicts.

"...Honestly?... Cause this is a Loyalist area." (Male, 49 years, Knockmore, Lisburn)

People have also had the same reason to move out of areas they were previously living in search of more neutral areas and vice versa due to personal and social reasons. Whilst these issues dominate the decision for residential selection, all other issues like travel choices become secondary. Thus perceptions have a very strong influence on travel modes and historical legacy leaves behind impressions which are translated through the generations.

5.3 Social constructs and motives, Residential immobility and resultant travel patterns

Longer travel distances, be it for commute or any other purpose, is a common observation in many parts of the globe today [16],[19], and the reason for this is the distance between the residential location and other activity locations. Whilst the values attached to family connections, social motives and familiarity with the area are given primacy by almost all the participants and interviewees from across the case study areas, these values were also guided to some extent by factors related to urban form characteristics in some ways.

"...I choose to live where I am because first of all it is where I grew up, social connections, family.... Also specifically where I live, I moved there to get my children in that particular school..... I have all the facilities and amenities nearby, some of the things are within walking distance,..... there are football pitches all around."

(Male, 40 years, Knockmore, Lisburn)

"...It is about personal preference.... that is my community, I am a rural person. The family is there around me... I'm connected to the church... Too strong connections."

(Male, 53 years, Banbridge)

Living close to the family is an important reason particularly for families with young children who depend on help from the family for childcare and support, the reason why young single professionals find city life attractive but once children come along there is an economical

aspect that needs to be considered as childcare costs still far exceeds the longer commute cost in households. The anti-urban sentiment is thus strengthened by the lack of family support, more residential space and cheaper lifestyle factors.

Another bracket of respondents comprised of the non-natives who are a consequence of modern day globalization trends. They present slightly different residential choices, mainly work related although the neighbourhood profile, accessibility and safety concerns are linked to those choices. As they have no long term bearing with the area, their choices are more directly guided by urban form characteristics and travel choices.

*"....It is my husband's job.....he found job in Lisburn,....almost 6 years now in this job."
(Female, 34 years, Knockmore, Lisburn)*

Thus we find that urban form characteristics play a major role in their (ethnic minority) residential choices and hence their travel patterns.

5.4 Economics of travel patterns in relation to the urban context.

Every individual associates a cost to travel, be it the direct cost of travel associated with the mode of travel, travel time calculated in terms of cost, or the cost of road tax, fuel and insurance associated with the mode of travel. This is in line with the economic utility theory which contends that humans make trade-off between travel choices based on available time and money to maximize the utility gain [23]. In all the three case study areas it was observed that public transport ridership and the use of car was largely influenced by the cost involved in making the journey using either mode. However utility perception varied between the inner city residents of Belfast and the suburbs and further out towns like Banbridge. While in Ballynafeigh ward, in Belfast, participants have expressed the car as an added cost and not a necessity, outside Belfast using public transport is more expensive as one is already paying to maintain a car, so it is the cost of fuel equated against the cost of tickets which often works out much more expensive, hence the utility of car. Also the perception of the cost was found to be dependent on the start point of the trips. For journeys originating outside Belfast, the cost of car worked out cheaper. Thus the urban form at the residential location seems more influential in determining the mode of travel.

"....Public transport is more expensive than petrol for my car for a week, so that's why I don't do it..... It is over £7 a ticket from my house to here (Belfast) a day. So it wouldn't pay me to do that...."
(Female, 29 years, Ballynafeigh, Belfast)

Thus an element of cost directly influences the travel choices one makes. Although habits, preferences, urban form characteristics are considered influencing factors, if people can't afford, they would not use a certain mode.

"...The only thing that will change behaviour apart from hypnotizing people will be money.....It's all about the cost of it."
(Male, 53 years, Banbridge)

Thus while very few people give thought to travel patterns, others who are restrained by finances are obliged to plan their travel schedule to minimise travel costs. So, in a way, the utility maximisation theory definitely plays an important role in our travel decisions just as it is no pariah to all other important decisions we take in our daily lives.

5.5 Demographic segmentation and driving license determining public transport patronage

Another interesting observation from the focus group discussions and in-depth interviews in Belfast, Lisburn and Banbridge revealed the variations in travel mode choices amongst users in terms of human demography. The availability of driving license, car ownership, age, family status and free bus pass are the five major determinants of public transport ridership across the urban spectrum in Northern Ireland. While in the city the public transport patronage is more and diverse in terms of the age of the passengers due to the good frequency and availability of the service, outside the city limits it is dominantly used by students and free bus pass holders.

"...Transport issues are the most important for the young and the elderly.....the young person going to school, public transport is vital to them.... and the older retired person who doesn't want to have a car....."
(Male, 67 years, Banbridge)

But while we find that these two segment in the population is more dependent on public transport, their choices are restrained by driving license and car availability or influenced by the free cost of transport option. So it is more of a compulsive behaviour rather than a conscious choice to move towards sustainable transport.

Another type of observation was that as public transport did not offer flexibility, it was unsuited for families with young children who had to do trip chaining. Modal shift was also observed in case of family status changing with the arrival of children and associated childcare arrangements.

"...Personally tend to use car, because.....I have a one year old child....so drop off and pick up enroute work..... but if I didn't have that I would use park and ride as the journey would be quicker and also probably be cheaper...."
(Male, 34 years, Belfast)

Thus demographics largely play the constraint role in influencing travel behaviour in the current study context.

5.6 Implementation and acceptance of integrated policy measures

To explore the influence of policy issues in the real world, in terms of implementation of the planning strategies, in-depth interviews were conducted with the executives, planners, policy makers, transport providers and other independent experts. The impact of these policies on the local residents was then explored using the focus group discussions in the case study areas to understand the success of these strategies. Most notably the stress was on efforts to improve accessibility using modal split and restraint measures towards the city core. This was implemented using the Park and Ride system mainly which is gaining popularity while in the suburbs the focus was more on improving the connectivity between housing growth and transportation with the emphasis on brownfield regeneration where possible. Also the park and ride system brought in new public transport users who were not using public transport before.

"...I suppose the new thing is the Park and Ride, in Sprucefield.... and so on. And there is probably scope for some more further out.... Like of I was going to Belfast....I would go to Sprucefield..... from home to Sprucefield and get the bus in...."

(Male, 53 years, Craigavon)

The availability of free car parking spaces in some parts of the city is visualized as another barrier for these measures.

"...The park and ride is only 3 miles away and I get the free parking on the street, so again it wouldn't pay me."
(Female, 29 years, Ballynafeigh, Belfast)

Also to complement the efficiency of the Park and Ride, especially in the morning rush hours, more dedicated bus lanes were introduced to which there has been a huge uproar by road users. This was also to facilitate the other big transportation initiative, the Belfast rapid transit which is going to connect the park and ride sites to the city centre through dedicated bus corridors in the near future. So there is a 'carrot and stick' approach adopted by the government to change travel behaviour but there is still low general acceptance.

As we go further out of the Belfast city core, other initiatives like the integrating new developments with transportation initiatives were proposed; however no great success has been achieved in terms of this integration. One such example was the first eco-village in Northern Ireland- Woodbrooke village in Lisburn which would have been an exemplar of the integrated approach but was abandoned midway due to the economic downturn. Another such initiative to promote brownfield regeneration and link it with the railway in the form of a 'transit oriented development' was mentioned by one of the interviewees who also mentioned the uncertainty and drawbacks of the scheme and concluded that implementation of integrated land use and transportation policies were still in infancy.

Also when we mention travel, the most common association is with the car or the bus. But active travel is gaining popularity in policy and due to rising obesity epidemic and other health issues and the need to integrate active travel with the urban form becomes all the more important. Such measures have been introduced in Banbridge in the form of footbridges across the river linking several important locations in the town centre by foot.

*".....If you take the town, in terms of network.... we have provided walkways across the river which actually means you can walk across the town centre.....walk into the hospital site, there is a whole integrated approach.....This is important in terms of active travel."
(Male, 53 years, Banbridge)*

In schools, to increase walking and cycling to schools soft policy measures were implemented to influence travel behaviour by Travelwise as school traffic accounts for a considerable volume of traffic every morning. Soft policy measures were also mentioned to influence train ridership in the form of slogans, however they were hardly mentioned by the local residents in the focus group discussions which reflect the value people add to such policy measures. Overall the hard policies seem to affect their daily travel patterns more. Also the implementation of any policy measure is going to face some resistance as it alters the normal daily schedule of people, so probably it is going to take some for the general acceptance and success of these measures to achieve sustainable travel patterns.

5.7 Trends within trends

At a glance, from the above discussion, the travel patterns and habits in Northern Ireland exhibit a fairly traditional car dependent society which is vastly rural in nature with scant belief in the public transport system. However there is a slow and gradual change in this mental set-up and people and over the years the influence of various policy measures and experiences are shaping new beliefs and habits which are encouraging in the light of sustainability. One such example was given by an interviewee in Banbridge who believed that issues like environmental awareness should be instilled from childhood to create a change in the society.

*"....I honestly do think that you got to start...get the notion into kids head. When I grew up, it didn't matter if you were drinking and driving.... now kids woun't even think about it. My generation still thinks.....can I have 1 pint, 2 pints and drive?.... My kids wouldn't even think about that!.... You know you wouldn't even touch it if you are going to go behind the wheel..... Just wouldn't.....It's just unacceptable behaviour - it's a behavioural thing."
(Male, 53 years, Banbridge)*

This explains the effectiveness of soft policies and awareness programs to change travel behaviour. Also a change in travel habit has been noted in the new generation students which was attributed to the tailor-made public transport incentive offered to them.

*".....we have products to suit them..... like the Y-Link ,for e.g. for till the age of 24 finding acceptance.....but lots of things have changed - it used to be third level students all lived in and around Belfast or Queens and you know.... now there is a change..... They are here from Mondays to Fridays and they don't travel back by car. They use PT. Gives us new peaks to deal with...."
(Male, 56 years, Belfast)*

This reflects that if transport policy is 'tailor-made' to address the specific target group needs, public transport ridership can increase which is more sustainable.

6. Discussion and Conclusion

Qualitative methods to explore the factors influencing travel behaviour still remain rare and this study has been designed to fill in this gap left to gain a better understanding of the complexities of travel behaviour [4]. The seven overarching categories establish the influence of urban form on travel behaviour in the Northern Ireland context, however this relationship is sometimes a direct relationship and at other instances indirectly mediated through strong preferences, habits, socio-economic conditions and demographic influences.

The direct relationship is visualized in the form of the level of urban infrastructure, the urban density, the location of the activity places, the type of urban form infrastructure at the start and end of trip etc. which influences travel mode, travel time and travel distances.

Then there are factors like segregation due to the 'troubles' which played an important role in shaping the urban form and people's perceptions in Northern Ireland. These perceptions have a direct effect on travel mode which relates to the safety, security and independence of the individuals. This also started the trend of out-migration which meant the loss of the critical mass to support a good public transport system, hence the tradition of car still dominates the society. Another legacy of the troubles was the fragmented urban form structure and polarization. As people felt safe within their community, a sense of residential immobility was instilled in the individuals, which is still very dominant all across Northern Ireland today. Again this residential immobility was facilitated by the geography of Northern Ireland as most places were still within commute range. Also coupled with this is the fact that there is an over-generous road network, and much of this is rural roads, more miles per capita, as compared to other parts of the UK. This has also resulted in a strong preference for rural living as there is good accessibility due to the available road network further strengthening the anti-urban sentiments. So all these aspects are intertwined which facilitates the use of car as the dominant mode of travel.

The residential location which is the starting point for any travel pattern is an influential element and very strong social and family ties influence these decisions along with the urban form facilities and amenities. While respondents have mentioned family and friend and familiarity with the place as reasons for choosing to live in that particular area, the emergence of 'commuter towns' show that urban form amenities and facilities also play an important role. The commuter towns are generally located for easy commute along motorways and again people choose these commuter towns to stay close to their family but still within a mass location to enjoy better infrastructure.

Also residential location is vital to individuals with young children for family support as the cost of childcare far exceeds travel costs. The other economic aspect of travel is the cost of travel that plays an important role in deciding commute mode as often people who are maintaining a car find the cost of public transport an added cost and vice versa in the inner city situation. The economics of the two modes are evaluated in terms of the cost of fuel and the cost of tickets, in which case often the latter works out more expensive. Another economical consideration is the parking cost which acts as a deterrent to use the car to travel to Belfast.

Thus although there is an element of residential immobility in the local residents, this also means that their social sphere of travel is not too large. Thus travel for social purposes and to visit family is less and travel to work comprises of the larger share of travel miles. However travel-to-work can be accommodated in mass transit arrangements as opposed to social and family visits which are distinct locations for every individual. So barriers can be visualized as opportunities as well.

The role of demographics in terms of age, license, car, family status and free bus pass are the main factors determining the public transport ridership. However these choices are not always a conscious decision but often a forced option due to the lack of other alternatives.

Government policies have also influenced travel choices over the years. On a spatial context we will find the use of restraint policies like introducing bus lanes and taking away motor lanes in the core of the city which are to be used by rapid transit in the form of buses bringing in people from park and rides which are situated on the periphery of the city. Thus park and rides are created all around the city in various locations for people coming into the city from other towns and hinterlands. Thus a mass location is created from which dedicated bus corridors will take people into the city. As we go out further away from the city limits, we find that the policies are more focussed on integrating the housing with transportation linkages with an overall brownfield regeneration objective where possible. Also policies aimed at promoting active travel have been identified in the form of footbridges to connect parts of the town in places like Banbridge. Then there are the soft policies which are aimed at changing behaviour in the form of travel plans, cycling and walking to school etc. Thus a 'carrot and stick' approach is adopted but resistance to these measures were also observed amongst the residents showing an initial low level of acceptance.

Finally we find that there are trends within trends, and while we see Northern Ireland as a vastly rural car dependant traditional society, the younger generation is showing changes in

travel behaviour in terms of modal shift to public transport due to incentive ticketing policy targeted at them. Another influencing factor was noted that the way that we are brought up has an effect on the way we adopt our travel patterns, in which case soft policies have a great role to play to influence travel behaviour right from the childhood.

Thus in general we find a very car dependent society in Northern Ireland but there are changing patterns of settlements and travel behaviour which is encouraging to find. So while there is a strong anti-urban sentiment, there is also the growth of commuter towns which is again essentially creating mass locations. Also we find rigidity in residential location as compared to travel patterns which people are happier to adjust, which means there is flexibility in travel patterns and the right intervention can achieve sustainable travel patterns.

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